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WORK PLAN FOR
ENGINEERING DESIGN OF THE
BYPASS OF THE NORTH DITCH
AT OUTBOARD MARINE CORPORATION
WAUKEGAN, ILLINOIS

28 AUGUST 1981

NOT
CONFIDENTIAL

Prepared for
USEPA Under
Contract No. 68-03-1613

By
Roy F. Weston, Inc.
Environmental Consultants/Designers
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27 August 1981

Mr. William J. Wise
Contract Specialist
Contract Management Division
U.S. Environmental Protection Agency
26 West St. Clair Street
Cincinnati, OH 45268

W.O. 0300-91-03

RE: Work Assignment Z-2-3
Outboard Marine Corporation
Waukegan, IL

Dear Mr. Wise:

WESTON is pleased to transmit the work plan and project costs for the "Design of the North Ditch Bypass at Outboard Marine Corporation, Waukegan, Illinois". The scope of work reflects discussions with Messrs. Rutter and Van Laan of Region V, a visit to the site vicinity and review of some of the key past reports.

We believe that the information obtained to date is sufficient to prepare the enclosed work plan. However, detailed initial evaluation will be required to insure that the most cost-effective alternative to bypass storm water flow is developed. Part of this evaluation will be a detailed review of the work by Greeley and Hansen. In addition, we will very rapidly evaluate whether or not there may be a more cost-effective method of bypassing the North Ditch storm water run-off. That evaluation will be based on life cycle costs. This will compare a large conduit to a pumping station which may be more attractive because of the construction costs inherent in placing the discharge of the conduit out in the lake. This assessment will be available within the first sixty days and will be based in part on evaluation of the contamination of the ground water.

The Site Manager assigned will be Mr. Elton Breland, P.E., who is a Project Manager in our Chicago office. He will be backed up by a team chosen to successfully complete each work task. Subcontractors will be selected for the site survey and to provide drilling services.

WESTON

Mr. William J. Wise
U.S. EPA

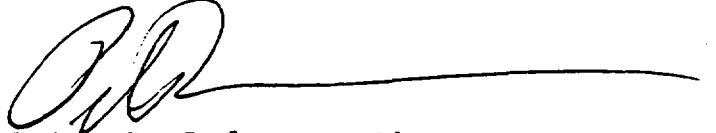
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27 August 1981

The enclosed work plan includes a schedule and cost estimate. We are prepared to commence work as soon as approval is obtained from you. Should you have any questions, please do not hesitate to contact Dr. Robert J. Schoenberger or myself.

Very truly yours,

ROY F. WESTON, INC.



Peter B. Lederman, Ph.D., P.E.
Vice President
Hazardous/Toxic Materials Management

PBL:ml

Enclosure

cc: P. Beam - U.S. EPA, Wash.
A. Rutter - U.S. EPA, Chi.



WORK PLAN

for

ENGINEERING DESIGN OF THE BYPASS OF THE NORTH DITCH
AT OUTBOARD MARINE CORPORATION, WAUKEGAN, ILLINOIS

SECTION 1. INTRODUCTION

1.1 PURPOSE

This work plan outlines the specific efforts necessary in the design of bypass facilities for the North Ditch as required under Work Assignment Z-2-3 and is intended for review/approval by the USEPA prior to commencement of work. The purpose of this work plan is to develop:

- A detailed technical approach for the successful completion of the EPA work assignment.
- A schedule for completion of the work assignment.
- A cost breakdown.

The major objectives of Work Assignment Z-2-3 are understood as follows:

- Develop all watershed and site information necessary for the design of the North Ditch Bypass.
- Define the location and quantity of contaminated material to be removed.
- Develop implementation plan, detailed plans and specifications, and bid package for construction of a North Ditch Bypass.

1.2 BACKGROUND

The North Ditch is a small tributary on the west shore of Lake Michigan just north of Waukegan harbor. The ditch drains a land-fill area, a portion of the property owned by Outboard Marine Corporation (OMC) and some property owned by the Waukegan North Shore Sanitary District. The Bypass involves only that portion of the North Ditch downstream of the Elgin, Joliet and Eastern Railway Company tracks including the Crescent Ditch, Oval Lagoon, and the East-West portion of the North Ditch.

A preliminary study by Mason and Hanger of Lexington, Kentucky summarized preliminary estimates of PCB contamination of the North Ditch, since the early 1950's until the mid 1970's. The Mason and Hanger report along with several previous reports suggest that substantial contamination of the North Ditch exists



downstream of the Elgin, Joliet, and Eastern Railway Company tracks. The extent of the PCB contamination has been estimated, but not fully defined. However, current data show conclusively that substantial quantities of contaminated soil will have to be removed from the Crescent Ditch, Oval Lagoon parking lot, and the East-West portion of the North Ditch. This work plan for North Ditch and areas adjacent to proposed storm sewer assumes final disposal of contaminated material to offsite landfill.

1.3 SCOPE

The scope of this work assignment is to develop plans, specifications, and a bid package for the construction of a bypass for the North Ditch to facilitate the removal of contaminated material from the North Ditch area. This task will involve removal and disposal of contaminated material to allow the bypass system to be constructed on uncontaminated substrate. Other specific aspects of the study include development of necessary site information, and investigation of the extent of contaminated material to be removed. The work assignment has been divided into ten tasks as indicated below:

Task

1. Collection of background information
2. Safety plan development
3. Field survey
4. Watershed study
5. Soil/ground water study
6. Site contingency plan
7. Development of implementation plan
8. Engineering design
9. Preparation of the bid package
10. Bid conferences

The specific approach necessary to complete each of these tasks is presented in Section 2. This project will build upon previous studies done by Greeley and Hansen as well as Mason and Hanger. Information will be developed to supplement the existing data to allow the tasks to be accomplished. Other studies will be used as sources of data whenever possible.

1.4 CAVEATS

In preparation of this scope of work, WESTON has reviewed the pertinent documents prepared by others. Of particular interest is the studies and design of Mason and Hanger and Greeley and Hanson. After review of those data, together with the JRB report, WESTON believes that considerable question exists regarding the proposed bypass recommendations. Installation of the pipe arch into the ground water table is both costly, and of questionable efficiency. Having been faced with similar questions at other sites, WESTON

has found it necessary to install a pumping station for control of storm runoff. While the operating costs are greater for this approach, it is likely that capital costs will be significantly reduced. The use of pilings or deep dewatering techniques will be expensive construction activities. Because of the questions generated during WESTON's initial review of previous studies, a more detailed investigation will be performed before the conceptual engineering is begun. Although the construction methodology may change as a result of this review, the proposal contained in this scope of work addresses the performance of engineering design and preparation of a bid package based upon recommended procedures from past studies.

SECTION 2

TECHNICAL APPROACH

2.1 TASK 1: COLLECTION OF BACKGROUND INFORMATION

2.1.1 Meet With Regulatory Agencies

Since being selected for this Contract, WESTON has reviewed some of the existing background information from the U.S. EPA, including the Mason and Hanger report and the North Ditch bypass drawings and specifications by Greeley and Hansen. This information addresses some of the actions that have been taken to evaluate the PCB problems associated with the North Ditch Area.

Allowance has been made for a project initiation meeting between WESTON project team representatives and U.S. EPA, Region V personnel, to discuss the scope of the OMC project with the following objectives.

- Establish lines of communication between RFW and Region V.
- Obtain updated background information regarding ground water studies by Dr. Douglas Cherkauer and JRB Associates.
- Obtain any additional existing information from the Mason and Hanger report or previous reports pertinent to the project which has not been submitted to WESTON.
- Discuss proposed activities to take place at the site.
- Obtain updated information on recent changes/activities by OMC.
- Discuss changes/modifications by EPA to selected approach as outlined by Mason and Hanger.
- Obtain all available as-built drawings of facilities involved at the site.
- Discuss basis for progress reporting system.



2.1.2 Review of Available Data

A thorough review of all available data will be conducted by the WESTON project team. Based upon a cursory review of the available data, the supplemental site information necessary to complete this work assignment has been determined. All available information will be utilized in preparing the design plans and in completing the scope of work contained in this submittal. No report will be developed until the final engineering design is submitted.

2.2 TASK 2: SAFETY PLAN DEVELOPMENT

WESTON safety policy requires a specific safety plan be developed for any site which is potentially hazardous or dangerous for WESTON personnel. Where toxic chemicals are involved, this will include an on-site safety evaluation by the WESTON safety department as part of the initial site visit. The information gathered from this site visit will be used to prepare the final site safety plan. Since there are no records of any air monitoring on the site, the initial site safety sweep will include the use of organic vapor analyzer as part of the general site assessment.

Based on available information, the site team will not be utilizing any specialized respiratory protection. However, they will have self-contained breathing apparatus and air purifying respirators with appropriate cartridges available if the organic vapor analyzer should indicate the presence of organic vapors in the area.

Based on the site inspection, the air monitoring, and the careful analysis of the field investigation protocols developed by the site manager, a site specific safety plan will be designed for the field investigations at Outboard Marine Corp. From the analysis of available background information, a list of safety equipment which will be needed on-site for the field investigation stage has been developed (see Table 2.1). This table is assumed to be complete, but may be modified as a result of the initial site safety visit.

During all field operations, WESTON will have an on-site safety officer. The safety officer will be responsible for maintaining safe working conditions, modifying the safety plan in response to changing conditions; directing operations in case of emergency; and collecting information needed to develop a safety plan for remedial operations.

The site safety officer will be directly responsible to the corporate safety director for all safety related matters on-site. The site safety officer has the authority to temporarily halt operations in response to any unforeseen contingencies. The site safety officer will provide weekly reports to the corporate safety director concerning operations on the site. The corporate safety director or his assistant is available on a 24-hour basis in case of emergency.

TABLE 2.1

EQUIPMENT AVAILABLE ON-SITE

1. Chemically treated coveralls
2. Boots - Safety, steel toe and shank
3. Boots - Chemically resistant (neoprene), steel toe & shank
4. Gloves - butyl rubber
5. Gloves - canvas, work
6. Hard hat with face shield
7. Air purifying respirators (1/person)
8. Self-contained breathing apparatus
9. Organic vapor/acid and particulate cartridges
10. Escape air masks - 5minutes of air (1/person on-site)
11. Eyewash unit
12. O₂ inhalator
13. Explosimeter/O₂ indicator
14. First aid kit (field emergency)
15. Fire extinguisher
16. Stretcher
17. Wash tubs for decontamination
18. 5 gallon spray cans for decontamination
19. Alconox solution for decontamination
20. Safety glasses
21. Safety ropes and harnesses
22. Balanced salt solutions (Gatorade)
23. Disposable coveralls (available if needed)
24. Emergency warning equipment (air horns, bull horn & 2-way radio)

2.3 TASK 3: FIELD SURVEY

A field site survey will be conducted to obtain information not obtained during previous work at the site and to verify some of the key locations and elevations. The information to be obtained or verified will include:

- 1) Pertinent property lines.
- 2) Ground contours and topography.
- 3) Locations of key physical features above and below grade.
- 4) Establish bench marks.
- 5) Elevations of pipes, ditches and other critical items.
- 6) Definition of drainage areas.
- 7) Leveling of wells used to determine ground water gradient.

A site plan will be prepared based on the existing information and information obtained during the field survey. This site plan will be utilized during subsequent tasks as the basis for site investigations, preliminary engineering and final design. Existing information on the site will be used to the maximum extent possible.

The map prepared will show the pertinent portions of the site that either affect or are affected by the North Ditch Bypass project. A base stable topo map will be prepared with pertinent features superimposed thereon. It is expected that this work will be performed by a subcontractor selected by WESTON and licensed to practice surveying in the State of Illinois.

2.4 TASK 4: WATERSHED STUDY

A study will be conducted to determine the size, slope, surface characteristics and other hydrologic parameters of the watershed tributary to the North Ditch area. Using this information and a synopsis of the climatologic history of the area, the peak storm water flow rates to the area will be determined. Peak flow rate and quantity from the area upstream of the proposed bypass will be determined together with the flow rates from existing storm sewers and overland flow presently discharging to the North Ditch area. Existing storm sewers serving the OMC buildings and parking lot will be included. Overland flow from the parking lot, NSSD sewage treatment plant, and railroad will be included. The peak storm water runoff determined during this task will serve as the basis for design of the bypass and related facilities in Task 8.

The runoff event selected for design in Task 8 will be the 50 year storm event. The storm intensity will be determined as the maximum runoff based on the expected peak flow for the time of concentration at the site. Hence, the rainfall intensity used to develop the flow rates will be the 50 year recurrence interval for intensities based upon one-half hour, one hour, two hours and four hours. The time of concentration will be determined using the rising wave dynamic technique or another acceptable procedure.

2.5 TASK 5: SOIL/GROUND WATER STUDY

WESTON soil scientists and geologists will determine the extent of soils contamination by PCB's in the North Ditch Area. WESTON will quantify the soils which must be removed during the construction of the storm water bypass pipe. In order to determine the extent and quantities of PCB contaminated soil, the following subtasks must be completed.

2.5.1 Existing Data Review

WESTON has reviewed the soils and geologic data collected to date on the OMC project. The PCB soils and water data includes the Mason and Hanger, January 1981 Report, the JRB Associates, Ground Water Study, as well as the other sampling investigations conducted at the site. Review of the data allows WESTON to strategically locate the necessary borings to determine the quantity of contaminated soil to be removed.

Based upon existing data, WESTON has determined that ~~between 20 and 40~~ additional subsurface samples are required to reasonably estimate the amount of material requiring removal. The purpose of this task will be to estimate PCB contaminated quantities of soil for cost estimating associated with the construction phase of the OMC bypass installation. It will still be necessary to analyze information and take samples during excavation to determine those portions of the excavation requiring off site disposal. At an estimated cost of \$140 per cubic yard, it will be necessary to establish a sampling system which allows close delineation of the contaminated material.

2.5.2 Soil Sample Collection

After a review of the existing data at the OMC site, WESTON believes that between 20 ~~and 40~~ locations for borings and sample collection are needed. The sampling locations selected will be reviewed with EPA before the field boring and sample collection program is implemented.

The boring locations will be spaced to provide a center line corridor for the design and construction engineers of the bypass storm water system. At each sampling location, the boring will be extended to the top of the silt layer. Soil samples will be

collected by a split spoon at five foot intervals throughout the boring except for one sample at the surface and another at three feet. The geologist, soil scientist or geotechnical engineer will prepare detailed logs of each boring.

WESTON will provide to EPA, prior to startup of field activities, the contamination prevention procedures to be used in the collection of soil samples for PCB analysis. During each sampling the split spoon will be cleaned to prevent cross contamination of the soil sample. The equipment will be washed with distilled water and nano grade acetone for removal of any residual PCB on the equipment. The auger will be cleaned to prevent contamination of the deeper soil from contact with the top layer soil.

procedures?

2.5.3 Soil Analysis

The soil samples collected from the borings will be analyzed for selected chemical and physical parameters. Soil samples will be analyzed to determine the concentration of PCB's in the following sequence:

- All top soil samples taken at the boring location will be analyzed.
- All samples at the three foot depth will be analyzed.

Since it has been projected by Mason and Hanger, soils below four feet probably are not contaminated, no samples will be analyzed for PCB concentration until the results of the top two are completed. For borings which indicate that the PCB concentration in the soil is greater than ten parts per million, the succeeding two sample depths will be subjected to analysis. That is the sample taken at five feet and the sample taken at ten feet will be analyzed. No additional analysis will be done in those which indicate PCB concentrations less than ten parts per million at the three to four foot sample.

The PCB soils will be assigned to an EPA designated FIT analytical contractor. The total number of samples to be analyzed initially will be a minimum of 40 and a maximum of 60 based upon the selection of boring locations.

~ 60 soil 10 water

After results of analyses are received from the FIT laboratory, it is understood that WESTON will recommend a concentration level for PCB's as the threshold of contamination. The decision on that threshold will be made by EPA and the assigned number transmitted to WESTON within two weeks of assignment and recommendation.

*50ppm level
to be used*



The purpose of the PCB analysis and assignment of threshold contamination level will be used to estimate the quantity of material which must be isolated and stockpiled for offsite disposal.

The time frame which could result in a second set of samples being consigned to the FIT laboratory will not adversely affect this project. Since contaminated soil must be handled and stockpiled, the only design impact of additional material requiring off site disposal is to assign a physical size to the staging area. Of course there is a financial impact on costs associated with off site disposal.

In addition to the PCB soil analysis, other soil samples will be collected and analyzed for pertinent soil engineering characteristics. The soil engineering characteristics will be used in the design of the ground water dewatering system and in determining the required shoring necessary to provide trench stability or improve the dewatering efficiency. A total of six soil samples will be collected and analyzed for the following:

- Particle Size (ASTM D422) (6 samples)
- Unified Soil Classification (ASTM 2487) (6 samples)
- Remolded Sample Permeability (2 samples)
- Standard Proctor Consolidation Testing (3 samples)

The analyses will be performed by WESTON's soil engineering and boring subcontractor.

The boring subcontractor will take standard blow count samples for determination of penetration during the routine sampling. In addition to determine the foundation characteristics of the soil, three plate bearing tests will be taken at selected intervals along the center line of the bypass corridor.

All soil samples will be collected in properly prepared PCB sample jars. The samples will be recorded and chain of custody procedures will be followed when transferring the samples to the laboratory for analysis.

2.5.4 Ground Water Investigation

In order to design a ground water dewatering system for the North Ditch Bypass, an understanding of the soil characteristics in the saturated zone, water table conditions, general construction and design specifications for the ditch, and ultimate disposal of potentially contaminated water is vital.

WESTON

Soil characteristics such as grain size and the variability of grain size determine the porosity of the sediments. Porosity in turn, affects the permeability as well as the free pore water which must be removed during construction of the pipeline. Infiltration to the trench will determine the quantity and rate of removal necessary for construction dewatering. Since PCB contamination in the ground water at the site is probable, the daily withdrawal rates and concentrations of PCB will be important to adequately design treatment and disposal facilities.

WESTON's hydrogeologists will review the existing hydrologic site studies and published engineering reports. In addition, ten of the proposed soil borings will be converted into short monitor wells from which data relevant to aquifer conditions and water quality will be collected. One water sample from five wells will be taken to determine the chemical parameters given in Table 2.2. Two short term pumping tests will be conducted using five of the converted monitor wells. The tests will be used to determine specific capacity in three wells and specific yield in two wells. For the two wells where specific yield is to be determined, at least one monitoring well will be sited in close proximity to the pumping well so that drawdown can be measured. The monitoring wells will supplement the ground water profile.

The data necessary for the design of a dewatering system are:

- Sediment and soil types
- Depth to ground water
- Aquifer thickness
- Ground water flow direction
- Permeability and transmissivity of the aquifer
- Configuration of area to be dewatered, i.e., trench or pit dimensions
- Method of disposal, i.e., treatment plant, lagoon, or Lake Michigan
- Water quality (which impacts on disposal)
- Duration of dewatering operation

Once the foregoing data are analyzed, the quantity of water to be removed for excavation can be calculated. The volume of water that has to be removed on a daily basis will determine the type and configuration of the dewatering system. Preliminary data collection efforts indicate that the sediments under the site have a moderate permeability which may necessitate the withdrawal of

large quantities of groundwater, possibly on the order of 10^5 or 10^6 gallons per day. This flow rate would require an extensive system of closely spaced wells or drainage trenches to depress the water table sufficiently.

The results of the data analysis will be presented in a report that will give:

1. Aquifer characteristics, including water quality.
2. Quantity of ground water that must be removed to effectively dewater the work area.
3. Daily withdrawal rates.
4. Recommended dewatering system and its configuration.

Table 2.2

Chemical Parameters from Five
Monitoring Wells

1. PCB (before and after filtration).
2. Suspended Solids.
3. TDS.
4. TOC.

2.6 TASK 6: SITE CONTINGENCY PLAN

2.6.1 Objective

The objective of a site contingency plan for the North Ditch is to assure that the environment is protected to the greatest degree possible. It is possible that during the site investigation or during the remedial clean-up actions, there may be a release of contaminated material to the environment. The purpose of this site contingency plan is to outline actions that must be taken to assure that any release of material to the environment, whether large or small, is contained and properly managed in the shortest possible time.

2.6.2 Actions

The actions taken in development of a site contingency plan include:

- An evaluation of the on-site materials for use in containing any release.
- Contact spill contractors to determine their availability and their capability to address clean-up spills.
- Identify and locate any needed supplies.
- Identify and define State and local government roles.
- Identify and define regional response team roles.
- Construction of short term measures to prevent small releases.

Due to the nature of this project, a site contingency plan for investigation activities is not foreseen. However, a site contingency plan will be developed for use during the remedial clean-up activities.

During the construction phase, the activities which could result in accidental release are those associated with stockpiling of contaminated soil and malfunction of the ground water treatment plant. During the stockpiling of excavated contaminated soil, care must be taken to prevent erosion and siltation from the stockpile. Leaching of rain water to the stockpile material is likewise a potential source of contamination. Leaching may be diverted into the treatment facility as one method of handling potential contamination. The contingency plan to be developed for remedial action will anticipate the construction activity and provide for containment of accidental releases of PCB's to the environment.

2.7 TASK 7: IMPLEMENTATION PLAN

This plan will be integrated with the plans and specifications to be developed by WESTON. It will identify the necessary activities to take place and schedule for these activities from bid advertisement through completion of construction. The implementation plan will address the following:

- Roles, responsibilities, liabilities of all parties.
- Permits/approvals needed.
- Schedule for completion of project (bids/construct).
- Air/water/soil monitoring during and after clean-up.
- Safety standards and regulations.
- Contractual/legal requirements.
- Regulatory agency coordination.
- Bid procedures.
- Contract administration procedures.
- Decision on documentation, archives, etc., of clean-up actions.
- Ultimate disposal of contaminated material.
- Treatment of contaminated ground and surface water.
- Long-term maintenance of the site.
- Utility interference and relocation.

Some of the items noted above may require substantial time and effort to resolve. Development of the implementation plan will start during the early stages of the Work Assignment so that delays in completing design and starting construction can be minimized.

2.8 TASK 8: ENGINEERING DESIGN

2.8.1 Management Plans

2.8.1.1 Site Safety Plan

The safety plan outlined in Task 2 will be finalized taking into account any specific considerations evolving from the Implementation Plan and the Engineering Design. This plan will be based on prior monitoring of the site. It will be utilized in training of the selected contractor to assure safety of on-site personnel during the implementation of the remedial action alternative. All WESTON personnel will be fully trained. Requisite safety equipment will be maintained on site.

2.8.1.2 Site Contingency Plan

The site contingency plan will assure, to the greatest degree practicable, that there will be no release of contaminants to the environment. The plan will be developed from the baseline and on-site monitoring conducted during site investigations. The plan will be developed for the selected alternative and will specify responsibilities and activities to minimize the effects of any release of contaminants.

2.8.1.3 Community Relations Plan

All community relations activities will be the responsibility of the U.S. EPA. WESTON will be available to participate in public information and education sessions as required by U.S. EPA.

2.8.2 Preliminary Design

The bypass will be designed in a conceptual or preliminary fashion before final design (drawings and specifications) is started. During the preliminary design, the assumptions, criteria, flow rates, and other bases of the design will be finalized. Alternative methods and routing of the bypass will be investigated and preliminary cost estimates will be prepared. The alternatives will be analyzed and a report recommending a preferred alternative will be submitted to U.S. EPA for review and approval. The report will summarize the basis of the design and the analysis of alternatives. Preliminary drawings and cost estimates of the recommended alternative will be presented.

2.8.3 Drawings and Specifications

Based on the approved preliminary design recommendations, engineering drawings and technical specifications will be prepared to allow bidding by contractors (see Task 9). Work to be performed by the bidder or subcontractor will be defined. The drawings to be prepared will include the following:

- Site plan.
- Plan and profiles of the storm sewer centerline.
- Mass flow diagrams for contaminated materials and groundwater treatment and dewatering.
- Construction sequence plan.
- Utilities relocation plan and profiles.
- Erosion and sediment control plan.
- Miscellaneous details.
- Dewatering and/or ground water isolation plan.
- Contingency Plan details.

Sufficient detail will be shown on the drawings to allow the subcontractor to bid the work; however, details of construction practices or treatment processes normally covered in shop drawings will not be included. A total of ten drawings are anticipated.

Some of the key items which will be determined during the final design are as follows:

- 1) Sequence and methods of construction to expedite construction.
- 2) Methods of sideslope stabilization.
- 3) Method of dewatering deep excavations including pump rates, location and flow patterns.
- 4) Methods of isolating contaminated ground water from excavations.
- 5) Methods of relocating utilities conflicting with construction.

Technical specifications will be prepared in CSI (Construction Standard Institute) format and will be suitable for bidding. The general specifications (front-end or contractual requirements) will be prepared as part of Task 9.

A construction cost estimate will be prepared after completion of the drawings and specifications. This estimate will be a definitive estimate with an accuracy level of +25, -15%.

The design will include the preparation, design implementation and coordination of an environmental monitoring plan to be executed for the monitoring and sampling required in this Work Assignment.

As soon as practicable during the design, any equipment or construction/treatment process which may involve significant time delays will be identified so that the necessary steps can be initiated to expedite these items.

It is anticipated that the wastewater treatment plant to be used for ground dewatering will be a package unit from an equipment supplier. WESTON will design the limits of the process including waste quantities and concentration of PCB to be removed. Since the plant will most likely be moved during the construction phase, the package will call for a skid-mounted unit which can be moved as necessary during the construction operation.

Bid documents will be sufficiently complete to allow for field construction, excavation, installation of the pipe. It may be necessary to perform additional testing in the field so that determination of PCB contaminated materials can be adequately performed. Because of expensive cost associated with disposal, staging areas for contaminated and noncontaminated soil must be provided. Noncontaminated soils will be used as backfill to the construction ditch. It is conceivable that no additional fill will be required because of the large size pipe to be installed. Structural details and design of the pipe bedding foundation will be part of the final design.

2.9 TASK 9: PREPARATION OF BID PACKAGE

A bid package will be prepared to permit construction. The bid package will consist of the following main components:

- 1) Bidding documents.
- 2) Contractual, legal (front-end) documents.
- 3) Engineering drawings.
- 4) Technical specifications.

The engineering drawings and technical specifications will be prepared as part of Task 8. The bid-related documents will include all documents required during the bidding period for the project. These documents typically include:

- Advertisement for bids.
- Information on bidders.
- Bid forms.
- Bonds.
- Other bid requirements.

The contract-related documents include all documents necessary to define the roles, responsibilities, and liabilities of all parties to the construction contract. These parties typically are the Owner, Engineer, and Contractor. These documents normally include:

- Agreement.
- Bonds.
- Releases/waivers.
- General conditions.
- Supplementary conditions.
- Modifications or addenda to the work.

These documents also address such key items as: method and timing of payments, final acceptance of the work, rejection of work, completion time, liquidated damages.

The information and decisions needed to finalize the bid and contract-related documents will be obtained as part of the Implementation Plan (Task 7). In this task, these documents will be prepared based on the work in Task 7.

Due to the potentially hazardous nature of the material, the bid package will have to clearly define the work, responsibilities and liabilities of all parties involved.



2.10 TASK 10: BID CONFERENCES

Key WESTON personnel will attend conferences with bidders during the bidding period to answer questions related to performance of the work defined in the bid package. If significant clarification or definition of the work is made during such meetings, WESTON personnel will assist U.S. EPA in issuing addenda to the bid packages.

2.11 MEETINGS

Weekly meetings will be held between WESTON and Region V personnel (OTC) throughout the duration of this contract. A monthly written report will be provided detailing the activity completed during the previous month. Generally, the weekly meeting will be the responsibility of the Site Manager, Mr. Elton Breland, P.E., although on an as-needed basis the Project Manager, Dr. Schoenberger and the Chicago Office liaison, Dr. Ball, will attend the meetings. It is expected that their attendance will be no more frequent than monthly.

SECTION 3

SCHEDULE

The schedule for this effort is depicted in Figure 3-1 and requires 27 weeks to complete. The critical path is Tasks 5, 7, 8 and 9. Of particular importance is short turnaround for sample analysis. Four weeks have been allowed for analysis. Sampling can easily be completed in four weeks, barring unusual weather. Four weeks is normal turnaround for FIT analytical labs, but this will be closely monitored.

As shown in Figure 3-1, the schedule requires an orderly completion of tasks beginning with field data gathering and progressing to the engineering design and preparation of bid package. It is not possible to drastically alter the sequence of task performance, hence it is necessary that drilling and field information be gathered on schedule. WESTON recognizes that site access must be obtained sufficiently in advance of the expected entry date. For this reason, it is important that the drilling be completed by the end of October. The present schedule calls for drilling to commence approximately the middle of September and will be completed by the middle of October. Any slippage in this date could alter the total performance of this project. Winter weather may prevent the field survey from being performed on a timely basis if drilling is delayed one to two months. Without background information, the engineering design and bid package cannot be completed.

After submittal of the conceptual engineering package for EPA approval, it will require an additional 6 to 8 weeks for completion of the final design and bid package. Approximately two to four weeks have been allotted for EPA's approval of the conceptual design. Delays in excess of that response time can also extend the completion date for preparation of the complete package.

WESTON will use a modified PERT diagram for keeping track of each task. It shall be the site manager's responsibility to assure adherence to the schedule and to alert the OTC in the event of slippage in the schedule. WESTON will rely upon the OTC for assuming responsibility of all internal coordination except where direct contact with the project officer and contract officer is required.

FIGURE 3-1

SCHEDULE FOR THE OMC ASSIGNMENT

MONTHLY

NO.	TASK	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR				
1.	Collection of Background Information		▲										
2.	Safety Plan Development		▲										
3.	Field Survey												
4.	Watershed Study												
5.	Soil/Ground Water Study												
6.	Site Contingency Plan												
7.	Development of Implementation Plan												
8.	Engineering Design					▲		▲					
9.	Preparation of Bid Package							▲					
10.	Bid Conferences (when needed)												
	▲ Output												
	Note: Weekly progress meetings will be held at the USEPA Chicago office and monthly progress reports prepared by Weston.												

WESTON



SECTION 4

COSTS

Costs are summarized by Professional Level, Work Hour, and other direct costs in the attached Contract Pricing Proposal (Form DD 633-4). The total estimated maximum expected cost including estimated fee is \$221,850. This excludes PCB analytical costs, as these, we are informed, will be done by a FIT analytical contractor and billed directly.

The overhead was calculated using the provisional rate. WESTON reserves the right to apply the finally negotiated overhead rate. The fee of 12% is that proposed by WESTON for the master contract and WESTON believes should be based on the finally negotiated overhead rate.

The drilling and surveying will be by qualified subcontractors. The costs presented are believed to be maximum estimates.

Considerable discussion has taken place between WESTON and the drilling subcontractors. It is apparent that subsurface investigation in PCB-contaminated soil is not a routine contract. The projected cost for clean-up, special sampling, and employee protection increase the unit per foot drilling cost. Other questions relating to removal of contaminated material from drill holes, and treatment of water extracted from the ground during the pumping tests may increase the costs. Because the requirements in excess of normal contractual arrangements are impossible to define, the proposed contract with a drilling subcontractor will not include those items. The contaminated soil from the borings will be placed in plastic bags and stored in a centralized location on site. No off site removal is anticipated. Removal of contaminated soil from a site having the aerial contamination present such as OMC, cannot be justified either financially or from an environmental impact point of view.

If for legal or other administrative reasons, the responsibilities of the drilling contractor are altered, then a change of scope order will be sought.

TABLE 4-1

Total Estimated Cost by Task

<u>Task No.</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	<u>Total</u>
1. Collection & Analysis of Background Information		2,000	10,000	6,000	18,000
2. Safety Plan Development			5,000		5,000 ✓
3. Field Survey	Subcontract \$5,000				5,000**
4. Watershed Study		13,000	4,000	3,000	20,000
5. Soil/Ground Water Study*	8,000	17,000	10,000	5,000	40,000 ✓
6. Site Contingency Plan		2,000	2,000		4,000 ✓
7. Development of Implementation Plan	1,000	4,000	3,000		8,000
8. Engineering Design	20,000	10,000	10,000	5,000	45,000
9. Preparation of Bid Package	6,000	4,000	2,000		12,000
10. Bid Conference			1,000		1,000
11. Meetings			2,000	3,000	5,000
12. Community Relations				2,000	2,000
	35,000	52,000	49,000	24,000	160,000

* Plus \$30,000 drilling contract.

** Not included in Labor Total.

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This form is for use when (i) submission of cost or pricing data (see FPR 1-3.807-3) is required and (ii) substitution for the Optional Form 39 is authorized by the contracting officer.

PAGE NO.

NO. OF PAGES

NAME OF OFFEROR ROY F. WESTON, INC.	SUPPLIES AND/OR SERVICES TO BE FURNISHED Engineering Services - Outboard Marine Corporation Clean-up, Waukegan, IL	
HOME OFFICE ADDRESS One Weston Way West Chester, PA 19380		
DIVISION(S) AND LOCATION(S) WHERE WORK IS TO BE PERFORMED Engineering - West Chester, PA. & Chicago, IL	TOTAL AMOUNT OF PROPOSAL \$ 221,850	GOVT SOLICITATION NO.

DETAIL DESCRIPTION OF COST ELEMENTS

1. DIRECT MATERIAL (Itemize on Exhibit A)	EST COST (\$)	TOTAL EST COST ¹	REFER-ENCE ²
a. PURCHASED PARTS			
b. SUBCONTRACTED ITEMS (at cost)	35,000		
c. OTHER—(1) RAW MATERIAL			
(2) YOUR STANDARD COMMERCIAL ITEMS			
(3) INTERDIVISIONAL TRANSFERS (At other than cost)			
TOTAL DIRECT MATERIAL		35,000	
2. MATERIAL OVERHEAD³ (Rate % XS base =)			
DIRECT LABOR (Specify)	ESTIMATED HOURS	RATE/HOUR	EST COST (\$)
Category IV	338	29.32	9,912
Category III	875	20.50	17,938
Category II	1,300	14.50	18,850
Category I	1,368	9.50	13,000
TOTAL DIRECT LABOR			59,700
4. LABOR OVERHEAD (Specify Department or Cost Center)⁴	O.M. RATE	X BASE =	EST COST (\$)
(provisional rate - have requested 150% subject to negotiation of final contract)	140%	59,700	83,580
TOTAL LABOR OVERHEAD			143,280
5. SPECIAL TESTING (Including field work at Government installations)		EST COST (\$)	
See other direct costs			
TOTAL SPECIAL TESTING			
6. SPECIAL EQUIPMENT (If direct charge) (Itemize on Exhibit A)			
7. TRAVEL (If direct charge) (Give details on attached Schedule)		EST COST (\$)	
a. TRANSPORTATION		6,000	
b. PER DIEM OR SUBSISTENCE		4,500	
TOTAL TRAVEL		10,500	
8. CONSULTANTS (Identify—purpose—rate)		EST COST (\$)	
TOTAL CONSULTANTS			
9. OTHER DIRECT COSTS (Itemize on Exhibit A)			9,300
TOTAL DIRECT COST AND OVERHEAD			198,080
11. GENERAL AND ADMINISTRATIVE EXPENSE (Rate % of cost element No. 1) (included in overhead)			
12. ROYALTIES⁵			
TOTAL ESTIMATED COST			198,080
14. FEE OR PROFIT (@ 12%)			23,770
TOTAL ESTIMATED COST AND FEE OR PROFIT			221,850

and reflects our best estimates as of this date, in accordance with the Instructions to Officers and the Footnotes which follow.

SIGNATURE

Chapman

DATE OF SUBMISSION

EXHIBIT A—SUPPORTING SCHEDULE (Specify. If more space is needed, use reverse)

1. HAS ANY EXECUTIVE AGENCY OF THE UNITED STATES GOVERNMENT PERFORMED ANY REVIEW OF YOUR ACCOUNTS OR RECORDS IN CONNECTION WITH ANY OTHER GOVERNMENT PRIME CONTRACT OR SUBCONTRACT WITHIN THE PAST TWELVE MONTHS?

NAME AND ADDRESS OF REVIEWING OFFICE AND INDIVIDUAL

TELEPHONE NUMBER/EXTENSION

11 WILL YOU REQUIRE THE USE OF ANY GOVERNMENT PROPERTY IN THE PERFORMANCE OF THIS PROPOSED CONTRACT?

41 DO YOU REQUIRE GOVERNMENT CONTRACT FINANCING TO PERFORM THIS PROPOSED CONTRACT?

IV DO YOU NOW HOLD ANY CONTRACT (Or, do you have any independently financed (IFGD) projects) FOR THE SAME OR SIMILAR WORK CALLED FOR BY THIS PROPOSED CONTRACT?

✓ DOES THIS COST SUMMARY CONFORM WITH THE COST PRINCIPLES SET FORTH IN AGENCY REGULATIONS?

See Reverse for Instructions and Footnotes

OPTIONAL FORM 60 (10-)